rated longitudinal rows, which slightly converge anteriorly. Post-orbitar arch wanting. Tongue oval, flat, attached by its anterior and posterior borders, free laterally. Digits 4—5. Tail long, compressed.

H. cristata (Laur.) *Triton cristatus* Auctorum. What species Merrem assigned as the type of his genus Molge, we have been unable to ascertain, nor would it seem to be generally well known among herpetologists, from the number and variety of species to which it has been applied. The following are some of them:—Plethodon erythronotus, Hynobius nævius, Euproctus platycephalus, Triton palmipes, Diemychylus pyrrhogaster.

On the genus CALLIONYMUS of Authors.

BY THEO. GILL.

In the genus *Callionymus*, as it has been restricted by modern naturalists, three distinct genera are yet confounded. Sharing all of the following characters, two of them differ so much from each other in the position of the branchial apertures, that there can be no doubt of their claims to rank as separate genera. The characters common to all, and which distinguish them as a subfamily, will be first given, and afterwards the generic diagnoses.

The body is elongated, and often transversely oval anteriorly, and consequently broader than high; thence it gradually declines in height and thickness to the base of the caudal fin, and being often quite thick near that fin, assumes there a peculiar bulging appearance. The whole is naked and smooth.

The lateral line commences at the mastoids, and is connected, near its origin, to that of the opposite side by a transverse nuchal line; thence it generally declines slightly, and is then continued along the side of the back or the upper part of the side to the caudal fin.

The head is in general outline depressed and triangular, but varies in detail. The preopercle has a stout horizontal process which generally terminates posteriorly in a group of radiating and recurved spines, one above the other, or which has the spines along the superior border. The profile is oblique. The preorbitals or first sub-orbitals are prolonged anteriorly and frequently extended towards each other, thus forming a roof under which the jaws are concealed when retracted. There appears to be on each side but a single nostril, which is situated before the eye.

The mouth is small and sub-terminal, but under the muzzle, and is protractile downwards.

The teeth are villiform, and present in a moderately broad band in each jaw. The palate is smooth.

The tongue is generally far within the mouth; it is sometimes entirely united to the floor of the mouth, while at other times it is anteriorly free.

The branchiostegal membrane has on each side five or six slender rays.

The branchial apertures are very small and superior.

The first dorsal fin commences before the bases of the pectorals; it varies in shape, but there appears to be a constant arrangement of the rays. These are always four in number, and the first two are approximated at the base, but as the membrane enlarges, diverge from each towards their ends; the third is considerably posterior: the fourth is separated by a still wider interval from the third.

The second dorsal commences a short distance behind the first, is oblong and is distant from the caudal less than its length.

The anal has the form and structure of the second dorsal, but its commencement and termination are posterior to those points of the dorsal.

The caudal is elongated, but narrow, and has only from ten to thirteen articulated rays, of which from one to three of the superior and inferior are simple.

The pectoral fins are well developed, and are angular at the middle of their posterior margins. Their bases are vertical, but concave.

The ventrals are on the sides of the breast, and their bases are parallel or nearly so with the fish's length: they are separated from each other by a very wide and flattened area, and their posterior rays are connected by a membrane to the lower half of the bases of the pectoral fins. These fins are more or less larger than the pectorals.

Such are the chief external characters of this singular group, and as they are apparently common to all its species, they should in this case be eliminated from the generic, and much more from the specific description. The different proportions of these parts are their relative situation to each other, are alone specific characters. The fins present a singular diversity, not alone in form, but in structure, in even the same species. Some of them, especially the first dorsal and caudal, are often much more developed in the males than in the females. The rays, at least of many of them, are very variable in their character, sometimes nearly all them being simple, and at others, almost all are branched. It is therefore impossible to now give a formula indicative of the exact permanent condition of the fins.

Two of the genera confounded under the name of *Callionymus*, as has been already stated, differ chiefly in the position of the branchial apertures. In the true *Callionymi*, they are of an oval form, and situated near the inner angle of the superior opercular margin, and on the sides of the nape. In another group, they are present as small perpendicular slits behind the opercular margin, and have been well described by Valenciennes in the article on *Callionymus opercularis*. They are by that naturalist said to be concealed by a long pointed production of the operculum, and by a membrane which connects this production to the nape, and they thus present the appearance of transverse slits under this membrane when the opercula are raised up. Valenciennes has well remarked that the species whose peculiarity he thus describes may one day become the type of a peculiar sub-genus, but he has not so named it. There can be at this day no doubt entertained as to the propriety of forming for the species thus distinguished a distinct genus, and the name of *Synchiropus* is offered as its generic appellation, a name which alludes to the peculiar connection of the ventrals to the bases of the pectorals. The genus that will be described under this name does not embrace the *Callionymus dactylopus* of Bennet which is the type of a distinct, but allied genus.

The generic diagnoses of the genera will then be as follows:

I. Callionymus, L. restr.

Aperturæ branchiales ovatæ, in latere nuchæ utroque sitæ. Pinnæ ventrales spina et quinque radiis ramosis, omnibus membrana conjunctis.

This genus, as far as relates to the species referred to it, is synonymous with the genus *Uranoscopus* of Gronovius, who has reversed the Linnæan names of *Callionymus* and *Uranoscopus*, as used by modern naturalists, the former Gronovian genus including the *Uranoscopi* and the latter the *Callionymi*.

Besides the numerous species that have been already described, two that appear to be undescribed are in the collection of the North Pacific Exploring Expedition. One (*C. tæniatus* Gill,) is lilac colored, with a silvery line and row of spots on the sides, and with a black spot, bordered by white, on the first dorsal. The other (*C. inframundus* Gill,) is light brownish, marbled with white, and with a blackish first dorsal. The former is from China; the latter from Japan.

II. Synchiropus, Gill.

Aperturæ branchiales parvæ, lineares, fere perpendiculares, post opercula. Pinnæ ventrales radiis spinoso et quinque ramosis membrana conjunctis.

The genus thus characterized embraces five known species, which are all inhabitants of the Eastern seas.

1. S. lateralis.

Syn. Callionymus lateralis, Richardson, Zoology Sulphur, p. 65, pl. xxxvii, figs. 5 and 6. 1844.

The specimen figured by Richardson is a female. The male is distinguished by a more slender and elongated body, and by a first dorsal, about a third higher than that of the female. The first dorsal has also a black spot margined with white at the posterior angle, and the two bars of the caudal which are present in the female are absent in the male. There are also two rows of blue spots on the anal of the female, which are not mentioned in Richardson's descriptions: these spots are replaced in the males by two corresponding lines. Richardson simply states that his fish has a narrow streak of dusky brown near the lower border of the anal. There can, however, be no doubt as to the specific identity of these three varieties. Mr. Stimpson dredged specimens at Hong Kong from a depth of eight fathoms.

2. S. lineolatus.

Syn. Callionyme lineolo, } Val. Hist. Nat. des Poissons, vol. xii. p.
Callionymus lineolatus. } 307. 1837.

This species is quite distinct from the preceding, which has been compared with it by Sir John Richardson.

3. S. ocellatus.

Syn. Callionymus ocellatus. Pallas, Spicilegia Zoologica, Fasc. octav. p. 26, pl. iv. figs. 1, 2, 3. 1770.

(Callionime,) l'œille Daubent. Enc. Method. vol. 3, Poiss. pp. 75, 277. 1787.
Le petit Argus, } Bonnaterre Tableau Encyc. Method., Ichthyologie,
Callionymus ocellatus, } p. 43. 1788.
Callionymus ocellatus, Artedi Genera Piscium, Walb. ed. p. 608. 1792.
" " Linn. Systema Naturæ, Gmel. ed. p. 1154. 1793.
Callionyme pointillé, } Lacepede Hist. Nat. des. Poissons, vol. 2, pp.
Callionymus punctulatus, } 328, 340. 1800.
Callionymus ocellatus, Bloch Systema Ichthyologiæ Schneid. ed. p. 40. 1801.
Callionyme ocelle, } Val. Hist. Nat. des Poissons, vol. 12, p. 309.
Callionymus ocellatus, } 1837.
Callionymus ocellatus, Blkr. Natuurk. Tijd. v. Ned. Ind. vol. 8, p. 422. 1855.

4. S. opercularis.

Syn. Callionyme a grand opercules, } Val. Hist. Nat. des Poissons, vol.
Callionymus opercularis, } 12, p. 305. 1837.

5. S. opercularoides.

Syn. Callionymus opercularoides, Blkr. Natuurk. Tijd. v. Ned. Ind. vol. 1, p. 32. 1850.

A third genus with the branchial apertures in the same position as *Synchiropus*, is readily distinguished from that genus, as well as from the true *Callionymi*, by its first articulated ray; this ray is unbranched and much longer than the following, from which it is almost entirely separated, and is only connected with the spinous ray. To the only known species, the name of *Callionymus dactylopus* has been given. As the specific name alludes to the principal generic character, and is also much more appropriate as a generic than a specific one, it is now conferred on the genus, and the name of its author is given as a specific one.

III. Dactylopus, Gill.

Aperturæ branchiales parvæ, lineares, post opercula. Primæ ventrale radiis spinoso et quinque articulatis, radio primo articulato simplici, elongato, radio spinoso conjuncto, a radiis ramosis disjuncto. Pinna dorsalis prima spinis duobus primis filiformibus, longissimis, aliis filiformibus sed brevioribus.

1. D. Bennetti.

Syn. Callionyme a doigt libre, } Val. Hist. Nat. des Poissons,
Callionymus dactylopus, Ed. Benn., } vol. 12, p. 310. 1837.
Callionymus dactylopus, Blkr. Naturuk. Tijd. v. Ned. Ind. vol. 3, p. 559. 1852.